CLAIMS:

1. An optical system comprising an optical element arranged on an optical axis in the path of a radiation beam, the optical element (2; 116; 202) comprising a birefringent material, the optical element having a non-planar face (4) through which the radiation beam passes, wherein the optical system comprises a polarisation control system for controlling polarisation of the radiation beam such that the radiation beam has a polarisation which is non-uniform across a cross section (21; 24) taken perpendicular to the optical axis, the non-uniform polarisation having a distribution corresponding with a shape of the said non-planar face.

2. An optical system according to claim 1, wherein, in a plurality of sectors (22) of the said cross section, the polarisation of the beam has a substantially tangential polarisation, which is aligned in a different direction in at least some of said sectors (22).

3. An optical system according to claim 1, wherein, in a plurality of sectors (26) of the said cross section, the polarisation of the beam has a substantially radial polarisation, which is aligned in a different direction in at least some of said sectors (26).

4. An optical system according to claim 2 or 3, wherein the shape of the said non-planar face is rotationally symmetric about the optical axis (OA).

5. An optical system according to any preceding claim, wherein the optical system comprises an optic axis (AB) which is substantially parallel the optical axis (OA).

6. An optical system according to any preceding claim, wherein the polarisation control system comprises a first polarising element (54; 254) comprising a plurality of different sections (55), wherein each section is arranged to differently modify a polarisation of the radiation beam.

7. An optical system according to claim 4, wherein the first polarising element comprises at least four sections arranged in sectors about said optical axis.

8. An optical system according to any preceding claim, wherein the polarisation control system comprises an array of liquid crystal elements, wherein the liquid crystal elements have a configuration of different radial and/or axial orientations.

9. An optical system according to any preceding claim, in which the polarisation control system comprises a polarising system arranged to change an initial, substantially uniform polarisation of the radiation beam to the said non-uniform polarisation.

10. An optical system according to claim 7, wherein the initial polarisation is a linear polarisation.

11. An optical system according to claim 7, wherein the initial polarisation is a circular polarisation and the polarisation control system comprises:

- a first polarising element (54; 254) arranged to change said circular polarisation to an intermediate polarisation, and
- a second polarising element (56; 256) arranged to change said intermediate polarisation to said non-uniform polarisation.

12. An optical system according to claim 9, wherein the second polarising element is a grating.

13. An optical system according to any preceding claim, wherein the optical system comprises a phase modification element (99; 299), said phase modification element being arranged to introduce a phase modification into the radiation beam.

14. An optical system according to claim 12, wherein the radiation beam is of substantially one wavelength and the phase modification is substantially one phase cycle of the wavelength.

15. An optical system according to any preceding claim, wherein the radiation beam is an ultraviolet radiation beam.

16. An optical system according to any preceding claim, wherein the optical element is a lens element.

17. An optical scanning device for scanning an optical record carrier, said optical scanning device comprising an optical system according to any preceding claim.